Remarks

Claims 1-21 having been previously canceled, claims 31-37, 41 and 42 being canceled in the Amendment after Final mailed February 22, 2002, and claims 22 and 38 being amended herewith, the claims presently pending in the above-identified patent application are claims 22-30, 38-40 and 43.

The amendment to claims 22 and 38 reciting contacting the injured spinal cord with a polyalkylene glycol *after* the injury is made to clarify the invention and is supported by the specification at, for example, page 12, lines 24-30 wherein it is stated that the fusion agent is administered at various times "after injury" or "post-injury."

Rejections under 35 U.S.C. §112, first and second paragraphs

Claims 30-37 stand rejected under 35 U.S.C. §112, first paragraph. Claims 22-43 stand rejected under 35 U.S.C. §112, second paragraph. These rejections are respectfully traversed.

Entry of the Amendment after Final mailed February 22, 2002, has been requested. As a result, claims 31-37, 41 and 42 are canceled, without prejudice, thereby rendering the rejections moot with respect to those claims. Of the rejected claims, claims 22-30, 38-40 and 43 remain pending. Applicants fully incorporate herein the comments made in the Amendment mailed February 22, 2002, and direct the Examiner's attention thereto.

Reconsideration and withdrawal of the rejection of claims 30-37 under 35 U.S.C. §112, first paragraph, and claims 22-43 under 35 U.S.C. §112, second paragraph, is respectfully requested.

Rejections under 35 U.S.C. §102(b)

Claims 22, 24-29 and 38-39 stand rejected under 35 U.S.C. §102(b) as being anticipated by Davis et al. (J. Spinal Disorders, 1990, 3(4):299-306). This rejection is respectfully traversed.

Entry of the Amendment after Final mailed February 22, 2002, has been requested. Applicants fully incorporate herein the comments made in that Amendment. In addition, claims

22 and 38 are further amended herewith to recite contacting the injured spinal cord "after" the injury. The following additional remarks relating to this further amendment are offered.

At page 5 of the Final Office Action mailed November 23, 2001, the Examiner states that Davis et al. teach administration of a formulation containing PEG 3350 to the exposed nerve root **during** a spinal lumbar surgery (emphasis in the original). In discussing inherency, the Examiner cited Applicants' failure to distance the proffered claims from the anticipated prophylactic utility taught in Davis et al.

It is respectfully submitted that the amendment of claims 22 and 38 to recite contacting the injured spinal cord with a polyalkyene glycol *after* the injury effectively obviates the rejection under 35 U.S.C. §102(b). Reconsideration and withdrawal of the rejection of claims 22, 24-29 and 38-39 under 35 U.S.C. §102(b) as being anticipated by Davis et al. is respectfully requested.

Rejections under 35 U.S.C. §103(a)

Claims 23, 30-37 and 40-43 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Davis et al. in view of Brown (Clin. Orthopedics and Related. Res., 1977, 129:72-78) and Potter et al. (Clin. Invest. Med., 19(4) Suppl. S80, #533). This rejection is respectfully traversed.

Entry of the Amendment after Final mailed February 22, 2002, has been requested. As a result, claims 31-37, 41 and 42 are canceled, without prejudice, thereby rendering the rejection moot with respect to those claims. Of the rejected claims, claims 23, 40 and 43 remain pending.

Applicants fully incorporate the comments made in the Amendment mailed February 22, 2002. In addition, the following remarks are offered.

Claim 23 depends from claim 22, which is amended herewith to recite contacting the injured spinal cord with a polyalkylene glycol *after* the injury. Claim 23 is directed to treatment of a mammalian patient having a spinal cord injury in the form of a severed spinal cord.

Claim 30, as amended, also depends from claim 22, and recites contacting the injured spinal cord with PEG and 4-aminopyridine.

Claim 40 depends from claim 38, which, like claim 22, is amended herewith to recite contacting the injured spinal cord with a polyalkylene glycol *after* the injury. Like claim 30, claim 40 recites contacting the injured spinal cord with PEG and 4-aminopyridine. Claim 43 depends from claim 40 and recites a PEG having a molecular weight of about 40 daltons to about 3500 daltons.

As noted above, Applicants submit that Davis et al. do not teach, nor do they fairly suggest, using a polyalkylene glycol such as PEG to treat a spinal cord injury *after* the injury has occurred. Rather, as noted by the Examiner, Davis et al. teach administration of an anti-inflammatory agent (methylprednisolone acetate, in the form of Depo-Medrol, which includes PEG 3350 as a carrier) *during* lumbar surgery. The secondary reference Brown teaches treatment of patients with radiculopathy using Depo-Medrol, however radiculopathy is the consequence of nerve root damage, not spinal cord injury as in claim 23 (see attached web printout from the Department of Anatomy at the University of Wisconsin Medical School). And, while Potter et al. teach intravenous administration of 4-aminopyridine to spinal cord injured patients, they neither teach nor suggest a combination treatment utilizing a polyalkylene glycol and 4-aminopyridine, as recited in claims 40 and 43.

The research reported in Davis et al. and Brown is directed to the administration of anti-inflammatory agents, and the research reported Potter et al. is directed to the administration of a potassium channel blocker. None of the cited documents recognizes PEG as a potential fusagen to be administered in treatment of existing spinal cord injury. Therefore Applicants submit that the motivation to combine the teachings of any of the cited documents to achieve the claimed invention is not present in any of the cited documents. Moreover, the cited documents do not provide any basis for a reasonable expectation of success in achieving the claimed invention of treating existing spinal cord injuries with polyalkylene glycols.

Reconsideration and withdrawal of the rejection of claims 23, 30-37 and 40-43 rejected under 35 U.S.C. §103(a) as being unpatentable over Davis et al. in view of Brown and Potter et al. is, accordingly, respectfully requested.

Summary

It is believed that the pending claims are now in condition for allowance and notification to that effective is earnestly solicited. The Examiner is invited to contact Applicants' Representatives, at the below-listed telephone number, if it is believed that prosecution of this application may be in any way assisted or expedited thereby.

Respectfully submitted for
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CERTIFICATE UNDER 37 CFR §1.10:
"Express Mail" mailing label number: EV073730782US Date of Deposit: 23 May 2002
The undersigned hereby certifies that this paper is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR §1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, BOX RCE, Washington, D.C. 20231.

By: Jacquelyn K. Torborg
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APPENDIX A - SPECIFICATION/CLAIM AMENDMENTS INCLUDING NOTATIONS TO INDICATE CHANGES MADE
Serial No.: 09/438,206
Docket No.: 290.0042 0101

Amendments to the following are indicated by underlining what has been added and bracketing what has been deleted.

In the Claims

For convenience, all pending claims are shown below.

22. **(Twice Amended)** A method of treating a mammalian patient having suffered an injury to its spinal cord, said method comprising contacting the injured spinal cord after the injury but within a period no greater than about 24 hours after said injury with a C_1-C_{10} polyaklylene glycol in an amount effective to increase a compound action potential in said injured spinal cord relative to a level of said compound action potential immediately after said injury and to increase behavioral recovery after said spinal cord is treated.

23. The method according to claim 22 wherein said spinal cord is severed.

24. The method according to claim 22 wherein said spinal cord is crushed spinal cord.

25. The method according to claim 22 wherein said polyalkylene glycol is selected form the group consisting of polymethylene glycol, polyethylene glycol, polypropylene glycol, polybutylene glycol, polypentylene glycol, polyhexylene glycol, polyheptylene glycol, polyoctylene glycool, polynonylene glycol, polydecylene glycol and mixtures, thereof.

26. The method according to claim 25 wherein said polyalkylene glycol is administered to said patient in a pharmaceutically acceptable carrier.

27. The method according to claim 26 wherein said polyalkylene glycol is selected from the group consisting of polyethylene glycol, polypropylene glycol and mixtures thereof.

28. The method according to claim 22 wherein said polyalkylene glycol is polyethylene glycol.

29. The method according to claim 26 wherein said polyalkylene glycol is polyethylene glycol having a molecular weight ranging from about 40 daltons to about 3500 daltons.

30. The method according to claim 22, wherein said polyaklylene glycol is polyethylene glycol and wherein said method further comprises the step of contacting said injured spinal cord with a potassium channel blocker in the form of 4-aminopyridine in an effective amount and within an effective time of contacting said spinal cord with said polyethylene glycol so as to produce a synergistic increase in restoration of nerve function and reflex behavior in said patient.

38. **(Twice Amended)** A method of treating a mammalian patient having suffered an injury to its spinal cord, said method comprising contacting the injured spinal cord after the injury but within a period no greater than about 24 hours after said injury with polyethylene glycol in an amount effective to increase a compound action potential in said injured spinal cord relative to a level of said compound action potential immediately after said injury and to increase behavioral recovery after said spinal cord is treated.

39. The method according to claim 38 wherein said polyethylene glycol has a molecular weight ranging from about 40 daltons to about 3500 daltons.

40. The method according to claim 38 further comprising the step of contacting said injured spinal cord with a potassium channel blocker in the form of 4-aminopyridine in an effective amount and within an effective time of contacting said spinal cord with said polyethylene glycol.

43. The method according to claim 40 wherein said polyethylene glycol has a molecular weight ranging from about 40 daltons to about 3500 daltons.